WHAT IS CLAIMED IS:

1. A medical device for use in a mammalian body, comprising:

a structurally expandable element, wherein the element includes a binary superelastic alloy; and

the superelastic alloy includes a martensitic phase and an austenitic phase, with a transformation temperature set below a mammalian body temperature such that the superelastic alloy of the intraluminal element is always in the austenitic phase within the mammalian body.

2. The medical device of claim 1, wherein the binary superelastic alloy includes nickel-titanium.

3. The medical device of claim 1, wherein the mammalian body temperature is at most 37 degrees C.

4. The medical device of claim 1, wherein the binary superelastic alloy includes a ternary element selected from the group of elements consisting of: chromium (Cr), cobalt (Co), vanadium (V), or iron (Fe).

5. The medical device of claim 1, wherein the binary superelastic alloy includes titanium and a second element selected from the group of elements consisting of: iron (Fe), aluminum (Al), chromium (Cr), cobalt (Co), or vanadium (V).

6. The medical device of claim 1, wherein the binary superelastic alloy exhibits no superelastic behavior within the mammalian body.

7. The medical device of claim 1, wherein the binary superelastic alloy has no stress-induced martensite while under applied stress.

8. The medical device of claim 1, wherein the superelastic alloy has no stress-induced martensite while the intraluminal element is positioned in the mammalian body.

9. The medical device of claim 1, wherein the transformation temperature includes at least one of an austenite start temperature (A_s) and an austenite finish temperature (A_f) that is 25 to 150 degrees C below a martensite deformation temperature (M_d).

10. A medical device for use in a lumen of a human body, comprising:

an intraluminal element, wherein the element includes a binary superelastic alloy; and

the superelastic alloy having a martensitic phase and an austenitic phase, wherein a martensite deformation temperature (M_d) of the alloy is depressed to below human body temperature.

11. The medical device of claim 10, wherein the binary superelastic alloy includes nickel-titanium.

12. The medical device of claim 10, wherein the superelastic alloy includes hot working to depress the martensite deformation temperature (M_d) of the alloy.

13. The medical device of claim 10, wherein the binary superelastic alloy includes a ternary element.

14. The medical device of claim 10, wherein the superelastic alloy does not include stress-induced martensite.

15. The medical device of claim 10, wherein the superelastic alloy is defined by at least one of an austenite start temperature (A_s) and an austenite finish temperature (A_f) that is 25 to 150 degrees C below the martensite deformation temperature (M_d).

16. A method for providing a medical device for use in a lumen of a human body, comprising:

providing an intraluminal element having a binary superelastic alloy, wherein the superelastic alloy includes a martensitic phase and an austenitic phase; and

depressing a martensite deformation temperature (M_d) of the alloy to below human body temperature.

17. The method of providing a medical device of claim 16, wherein the binary superelastic alloy includes nickel-titanium.

18. The method of providing a medical device of claim 16, wherein the method includes hot working and quenching the alloy to depress a transformation temperature thereof.

19. The method of providing a medical device of claim 16, wherein the method includes adding a ternary element to depress the martensite deformation temperature (M_d).

20. The method of providing a medical device of claim 16, wherein the method includes heat treating the alloy to depress the martensite deformation temperature (M_d).

21. The method of providing a medical device of claim 16, wherein the superelastic alloy does not include stress-induced martensite.

22. The method of providing a medical device of claim 16, wherein a stress-strain hysteresis curve of the alloy has no flat plateaus.